

## REMARKS

Claims 1-10, 13 and 18-20 are pending and rejected.

Claims 11, 14-17 and 21 are withdrawn.

Claim 1 is amended.

### **Amended Claim 1**

Claim 1 is amended to insert the term "acidic" in steps iii) and vi), in order to clarify that the flocculants are added to an acidic medium.

Support is found on page 5, 4<sup>th</sup> paragraph and last line and page 7, lines 4-12 in the last paragraph. Further support is found in the separation steps iii) and vi) in example 1 on pages 13 and 14.

The spelling of charges has been correct.

No new matter is added.

### **35 USC 103(a)**

**Claims 1-10, 13 and 18-20 are rejected under 35 USC 103(a) as being unpatentable over Brink, US 4,384,897 in view of Brelsford, US 5,411,594 and Kuo, US 5,529,699.**

The examiner's states that Brink teaches a separation stage assisted by flocculation employing a flocculation agent consisting of charged microparticulate materials. However, this solids-liquid separation step occurs after neutralization, i.e. after "adjusting the pH of the aqueous liquor" (col. 5, line 61 to col. 6, line 5). Thus Brinks, contrary to the presently claimed process, suggests flocculation after neutralization, not flocculation of the acidic mixture.

According to Brink, col. 11, lines 23-31: "If a flocculating acidic material such as ferric or aluminum nitrate, sulfate or acetate is added, for example, through line 138a, it will enter hydrolysis unit 130 through recycle line 147 and will pass through line 155 into **neutralization** unit 156 where metallic ions will be precipitated as the hydrous oxides which will serve to flocculate solids suspended in the liquid and to precipitate these solids which then leaves through line 177 to secondary wet oxidation unit..."

Thus, the flocculating material (Fe or Al salts) is added to the hydrolysis unit I (unit 130), i.e. in acidic medium. This material is the "precursor" of flocculants and no flocculation occurs in unit 130. The solid-liquid separation occurs only in the neutralization unit 156. Indeed, flocculation can only occur in the neutralization unit as hydrous oxides are formed and this requires base addition.

In contrast, the present process requires subjecting the acidic mixture to one or more separation stages in which the solid residue and aqueous sugar liquor are substantially separated from each other. See steps (iii) and (vi) presently claimed.

After hydrolysis stage I (unit 10) the biomass material moves downwardly and the liquid phase is pumped through line 19 (cf. col. 2, lines 45-52 in connection with fig. 1), i.e. there is no suggestion to apply flocculating agents at this stage to improve solids liquid separation.

There is no suggestion to apply flocculating agents to the step after hydrolysis stage II, wherein a cyclone separator 71 in combination with several other separators (73, 78, 79, 85 and 86) is employed to separate solids from liquid (cf. col. 4, lines 7-25 in connection with fig. 1).

Therefore, Brink makes no suggestion to modify his process by flocculating or subjecting the acidic mixture to one or more separation stages in which the solid residue and aqueous sugar liquor are substantially separated. This would make no sense in Brink's as the Fe or Al salts cannot function in an acidic environment because it is the reaction product with base (hydrous oxides) which causes the separation and this requires a neutralized environment.

Examiner combines Kuo with Brink because Kuo teaches the use of flocculants as aids in pulp and papermaking systems.

The flocculants taught in Kuo can be water-soluble polymers formed from a water soluble blend of monomers, and polyacrylate salts, water-swellaable polymers and charged microparticulate materials such as clay and alumina.

Examiner believes there is motivation to combine Kuo with Brink's. Kuo teaches that the charged polymers are desirable for use as flocculants because their charge is pH-independent (col. 3, lines 26-29). Examiner believes this is desirable in the method taught by Brink et al. because Brink's method is conducted under acidic conditions.

However, the examiner is incorrect. The separation stages of Brinks are not conducted under acidic conditions as explained above.

The pH of the pulp suspensions disclosed by Kuo are usually basic, some examples are carried out at pH 8 (examples 11, 12 and 14), some at pH 5 (examples 13 and 16). The results for retention and drainage are better when the pH of pulp is basic. Therefore, the disclosure of Kuo would direct a skilled person to use flocculants in neutral or basic medium rather than in acidic medium in pulp suspensions.

Even though the charge on the polymeric flocculants of Kuo are pH independent (regarding the statement of the Examiner on page 8, item 10), clearly basic system give better results.

Thus there is no motivation to apply the flocculants suggested in Kuo to an acidic separation step of Brink because:

- There is no solid-liquid separation of an acidic mixture in Brink and indeed cannot occur under acidic conditions in Brink given the flocculants used by Brink;
- Retention and drainage results in Kuo are best run under basic conditions;

Furthermore, even if the two references are combined, the process which would result would be one wherein the solid-liquid separation occurs under neutralized conditions. The combination would not arrive at the present claim limitations of subjecting an acidic mixture to one or more separation stages in which the solid residue and aqueous sugar liquor are substantially separated from each other in steps (iii) and (vi).

Thus applicants, believe the above rejection is overcome and respectfully requests reconsideration.

#### **Double Patenting**

**Claims 1-3, 5, 8-10 and 13 and 18-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 4, 5, 7, 8,10 and 11 of copending Application NO. 10/523,229 in view of Brink.**

**Claims 1-10, 13, and 18-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 4, 5, 7,8, 10 and 11 of copending Application No. 10/523,229 in view of Brink and further in view of Brelsford.**

Both of the above rejections are provisional. The applicants wish to postpone submitting terminal disclaimers after the 103(a) rejection has been overcome. At that point, applicants will better know the final state of the claims and can address the appropriateness of the provisional double patenting rejections.

Reconsideration and withdrawal of the rejection of claims 1-10, 13 and 18-20 is respectfully solicited in light of the remarks and amendments *supra*.

Since there are no other grounds of objection or rejection, passage of this application to issue with claims 1-10, 13 and 18-20 is earnestly solicited.

Applicants submit that the present application is in condition for allowance. In the event that minor amendments will further prosecution, Applicants request that the examiner contact the undersigned representative.

Respectfully submitted,



Ciba Corporation  
540 White Plains Road  
Tarrytown, New York 10591  
(914) 785-2768  
SAL22332R1.doc

Shiela A. Loggins  
Agent for Applicants  
Reg. No. 56,221

Enclosure: Petition for one month extension of time.